

National Aeronautics and Space Administration



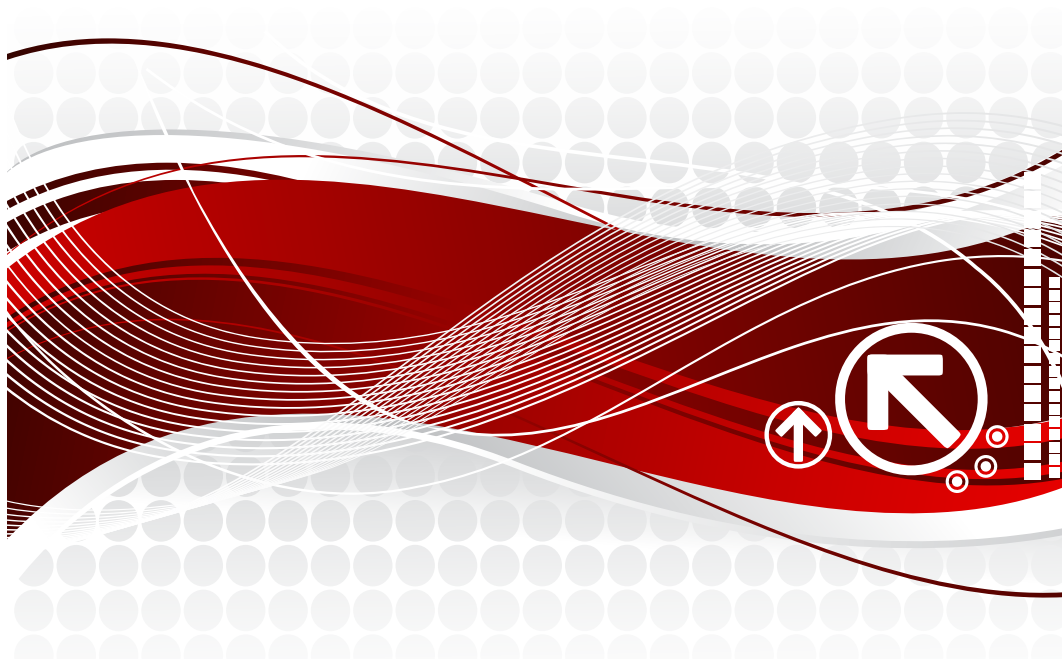
# NASA FUTURE FORUM

UNIVERSITY OF MARYLAND

RIGGS ALUMNI CENTER

COLLEGE PARK, MD

8.11.2011



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## WELCOME

Good Morning and Welcome to NASA's 2011 Future Forum!

America is beginning an exciting new chapter in human space exploration. This chapter centers on full utilization of the International Space Station, development of multiple, made-in-America capabilities for astronauts and cargo to reach low-Earth orbit, and pursuit of two critical building blocks for our nation's exploration future – a deep space crew vehicle and an evolvable heavy-lift rocket. Today, we embark on a new knowledge and innovation-driven approach to space science and exploration that will lead us into the frontiers of deep space.

Today, you will hear from leaders in industry, government, and academia, who will discuss advances in science, technology and exploration that will help future NASA missions, inspire the next generation of explorers, and grow the economy of Maryland, and the nation. Advancement of cutting-edge scientific research and technologies are critical for NASA's future, our nation's future in space, and our technological leadership position in the world. The economic competitiveness, national security, humanitarian, and societal benefits gained from federal investment in research, technology and innovation are well documented. NASA has delivered on these investments since its creation, and has inspired countless young people to embark on career paths in science, technology engineering and mathematics – skills critically needed for America's future.

By continuing to address grand challenges in human spaceflight and science, NASA will catalyze America's innovation engine and play a significant role in America's economic recovery. By taking humans to places never before visited, by developing technologies that will serve society in broad ways, NASA will continue to serve our nation well into the future.



## AGENDA

- 8:00 **WELCOME**  
Dr. Pat O'Shea,  
*University of Maryland*  
The Honorable Donna Edwards,  
*U.S. House of Representatives*  
*Maryland 4th District*  
Mr. Charles F. Bolden, Jr.,  
*NASA Administrator*
- 8:30 **NASA PANEL**  
INNOVATION, EXPLORATION,  
INSPIRATION AND NASA'S FUTURE  
Dr. Robert Braun, *NASA*  
Dr. Waleed Abdalati, *NASA*  
Dr. Laurie Leshin, *NASA*  
Mr. Leland Melvin, *NASA*
- 9:45 Break
- 10:15 **TECHNOLOGY AND INNOVATION PANEL**  
UNLEASHING THE POWER OF  
TECHNOLOGY AND CREATIVITY  
Mr. Peter Hughes, *NASA*  
Mr. Joseph Parrish, *NASA*  
Ms. Jennifer Byrne, *Lockheed Martin*  
Dr. Pat O'Shea, *University of Maryland*  
Dr. David Barbe,  
*Maryland Technology Enterprise*  
Dr. Ralph McNutt, *John Hopkins*  
*University, Applied Physics Laboratory*
- 11:15 **SCIENCE AND DISCOVERY PANEL**  
PUSHING THE LIMITS OF  
KNOWLEDGE TO INSPIRE  
A NEW GENERATION  
Dr. Michelle Thaller, *NASA*  
Dr. Waleed Abdalati, *NASA*  
Mr. David Pierce, *NASA*  
Dr. Matt Mountain,  
*Space Telescope Science Institute*  
Dr. Tony Busalacchi,  
*University of Maryland*  
Dr. David Novak, *NOAA*
- 12:15 Lunch
- 1:30 **TECHNOLOGY INVESTMENTS AND BENEFITS PANEL**  
TRANSFERRING AND  
COMMERCIALIZING NASA  
TECHNOLOGY TO BENEFIT  
OUR LIVES  
Mr. Daniel Lockney, *NASA*  
Dr. Gilmer Blankenship,  
*University of Maryland*  
Dr. Henry Hertzfeld,  
*George Washington University*  
Dr. Jayfus Doswell, *Juxtopia LLC*  
Mr. Asher Gendleman,  
*Zephyr Technology*
- 2:30 Break
- 2:45 **INSPIRATION AND EDUCATION PANEL**  
BUILDING IDEA FACTORIES FOR  
THE FUTURE  
Mr. Michael Lach,  
*Department of Education*  
Mr. Leland Melvin, *NASA*  
Dr. Mohammed Eltayeb,  
*Frostburg University*  
Dr. Mary Bowden,  
*University of Maryland*  
Ms. Susan Bardenhagen,  
*Fairfax County Public Schools*
- 3:45 Closing Remarks and Wrap Up
- 4:00 Dismissal

8:30 a.m. - 9:45 a.m.

## **NASA PANEL**

### **INNOVATION, EXPLORATION, AND INSPIRATION AND NASA's FUTURE**



**Dr. Robert Braun**

***NASA Chief Technologist***

Dr. Robert Braun is NASA's Chief Technologist and serves as the principal advisor and advocate on matters concerning agency-wide technology policy and programs. Dr. Braun has more than 20 years experience performing design and analysis of planetary exploration systems as a member of the technical staff at NASA's Langley Research Center in Hampton, Virginia, and the Georgia Institute of Technology. His research has focused on systems' aspects of planetary exploration, where he contributed to the design, development, test and operation of several robotic space flight systems.



**Dr. Waleed Abdalati**

***NASA Chief Scientist***

Dr. Waleed Abdalati is NASA's Chief Scientist serving as the principal adviser to the NASA Administrator on NASA science programs, strategic planning and the evaluation of related investments. He is currently on leave from his position as Director of the University of Colorado's Earth Science and Observation Center, which carries out research and education activities on the use of remote sensing observations to understand the Earth. Abdalati is also a Fellow of the Cooperative Institute for Research in Environmental Sciences at the University. His appointment as chief scientist marked a return to NASA, where he worked from 1996-2008.



**Dr. Laurie Leshin**

***NASA Deputy Associate Administrator ESMD***

Dr. Laurie Leshin is the Deputy Associate Administrator for NASA's Exploration Systems Mission Directorate (ESMD). ESMD is responsible for future NASA human spaceflight activities. This includes the development of commercial capabilities for low Earth orbit transport and new technologies to ferry humans to destinations deeper in the universe, such as asteroids and Mars. Her work involves daily oversight and planning for the implementation of the largest proposed shift in human spaceflight activities since the end of the Apollo program.



**Mr. Leland Melvin**

***NASA Associate Administrator for Education***

Mr. Leland Melvin is NASA's Associate Administrator for Education and is responsible for the development and implementation of the agency's education programs that strengthen student involvement and public awareness about NASA's scientific goals and missions. Melvin joined NASA in 1989 as an aerospace research engineer at the agency's Langley Research Center in Hampton, Virginia. He joined the astronaut corps in 1998 and has served as a mission specialist on two space shuttle missions: STS-122 in 2008 and STS-129 in 2009. He has logged more than 565 hours in space. In 2003, Melvin co-managed the former Educator Astronaut Program, which recruited teachers to become fully-trained astronauts in an effort to connect space exploration with students across the country.

10:15 a.m. - 11:15 a.m.

## **TECHNOLOGY AND INNOVATION PANEL**

### **UNLEASHING THE POWER OF TECHNOLOGY AND CREATIVITY**

Innovation and Technology are the keys to our next era of space exploration and our future economic prosperity. The panel will examine the role of how innovation and technology investments are changing how we approach future human and robotic exploration missions and how it can improve our economy beyond the space sector. The panelists will bring their unique perspectives on investments in technology and innovations that are impacting and shaping the future of their industry sectors, academic institutions, government agencies, and the overall US economy.



**Mr. Peter Hughes, Moderator**

***NASA Goddard Space Flight Center Chief Technologist***

Mr. Peter Hughes is responsible for planning, coordinating, and managing advanced technology-development programs at Goddard. Among his many responsibilities, Mr. Hughes advises Center leadership on strategies that leverage technology investments to advance NASA's ambitious science and exploration goals. Mr. Hughes, represents Goddard on NASA's new Center Technology Council, and manages the Center's Internal Research and Development program.



**Mr. Joseph Parrish**

***NASA OCT Division Director Early Stage Innovation***

Mr. Joseph Parrish has focused his career on aerospace system engineering, advanced technology development, and aeronautical and space flight operations. Mr. Parrish comes to OCT from the Jet Propulsion Laboratory (JPL) in Pasadena, California, where he was responsible for technology assessment and mission architecture planning for future robotic missions to Mars. Mr. Parrish was a founding member of the Mars Program System Engineering Team, and also served as the Deputy Chair of the NASA Telerobotics Intercenter Working Group. Before joining JPL, he was the President of Payload Systems, Inc. and the Vice President-Research and Development at Aurora Flight Sciences Corporation—two small businesses in Cambridge.



**Ms. Jennifer Byrne**

***Lockheed Martin Vice President Corporate Engineering & Technology***

Ms. Jennifer Byrne is Lockheed Martin's Corporate Vice President for Technology Strategy. A scientist and engineer by training, Jennifer has program management and technical leadership experience in complex, large-scale hardware and software development programs. In her current role, her emphasis is on alignment of technology investment supporting long-term growth for the enterprise. Her team investigates crucial technology trends dealing with national security issues that encompass many strategic variables such as cultural, political, social, economic, and environmental dynamics.



**Dr. Pat O'Shea**

***University of Maryland Vice President of Research and Professor***

Dr. Pat O'Shea is Vice President for Research and Senior Research Officer of the University of Maryland, and Professor of Electrical and Computer Engineering. He holds affiliate appointments in Institute for Research in Electronics & Applied Physics, Department of Physics, Maryland Nano Center, and Maryland Energy Research Center.

Dr. O'Shea's technical expertise lies in the field of applied electromagnetics, nonlinear dynamics and particle accelerator technology, and applications. Previously, he served as Chair of the Department of Electrical & Computer Engineering, Director of the Institute for Research in Electronics and Applied Physics (IREAP), Executive Director of the Center for Applied Electromagnetics, and Co-Director of the Maryland Cyber Security Center. He is a Fellow of the American Physical Society, Fellow of the Institute of Electrical and Electronic Engineers, and a Fellow of the American Association for the Advancement of Science, and a Distinguished Scholar-Teacher of the University of Maryland.



**Dr. David Barbe**

***Maryland Technology Enterprise Institute Director***

Dr. David Barbe is Director of the Maryland Technology Enterprise Institute (Mtech) and Professor of Electrical and Computer Engineering at the University of Maryland. After positions at Westinghouse, the Naval Research Laboratory and the Office of the Secretary of the Navy, he joined the University of Maryland in 1985. In 1978 he was elected as Fellow of the IEEE for pioneering work on Charge Coupled Devices (CCD's). He received the Stanford University Innovative Entrepreneurship Educators Award in 2002, the American Society of Engineering Education Outstanding Entrepreneurship Educators Award in 2003 and the Olympus Lifetime of Education Innovation Award in 2008.



**Dr. Ralph McNutt, Jr.**

***APL Science and Analysis Branch Scientist for Space Science***

Dr. Ralph L. McNutt, Jr. is a Physicist, and member of the Principal Professional Staff of The Johns Hopkins University Applied Physics Laboratory. He has been at APL since 1992 and before that held positions at Visidyne, Inc., M.I.T., and Sandia National Laboratories in Albuquerque. Dr. McNutt is Project Scientist and a Co-Investigator on NASA's MESSENGER mission to Mercury, Co-Investigator on NASA's Solar Probe Plus mission to the solar corona, Co-Investigator on the New Horizons mission to Pluto (principal investigator for the PEPSSI instrument), Co-Investigator for the Voyager Interstellar Mission (PLS and LECP instruments), and a Member of the Ion Neutral Mass Spectrometer Team on the Cassini Orbiter spacecraft.



11:15 a.m. - 12:15 p.m.

## **SCIENCE AND DISCOVERY PANEL**

### **PUSHING THE LIMITS OF KNOWLEDGE TO INSPIRE A NEW GENERATION**

NASA has stimulated knowledge by our numerous scientific discoveries. These discoveries have been pivotal in the evolution of American leadership in both sciences, basic and applied. Many believe that "discovery" must remain an important catalyst in our economy if we are to remain a major player in the global economy. In a larger sense, our scientific discoveries have spurred economic growth and inspired new generations to reach even further. The panel will look at the important role of discovery in past, current, and future space exploration, and will delve into NASA discoveries that have impacted our fundamental understanding of our planet, our solar system, and the universe.



**Dr. Michelle Thaller, Moderator**

***NASA Goddard Space Flight Center Astrophysicists***

Dr. Michelle Thaller is the Assistant Director for Science Communication at NASA's Goddard Space Flight Center in Greenbelt, Maryland. She also writes a monthly science column for the Christian Science Monitor and has made numerous appearances on television, including KCET's Life and Times and the Discovery Channel. Her research interests have included hot stars, colliding stellar winds, binary star evolution and evolved stellar companions.



**Dr. Waleed Abdalati**

***NASA Chief Scientist***

Dr. Waleed Abdalati is NASA's Chief Scientist serving as the principal adviser to the NASA Administrator on NASA science programs, strategic planning and the evaluation of related investments. He is also a Fellow of the Cooperative Institute for Research in Environmental Sciences at the University. His appointment as chief scientist marked a return to NASA, where he worked from 1996-2008.



**Dr. Matt Mountain**

***Space Telescope Science Institute Director***

Dr. Matt Mountain is the Director of the Space Telescope Science Institute, leading the 400-person institute that is responsible for the research done with the Hubble Space Telescope, and its planned successor the James Webb Space Telescope. Matt was previously the Director of the Gemini Observatory, which is based in Hilo, Hawaii which has telescopes on Mauna Kea and on Cerro Pachon, in Chile. He is also the Telescope Scientist for NASA's James Webb Space Telescope, a member of the Webb Science Working Group, a Professor at Johns Hopkins Department of Physics and Astronomy and a Visiting Professor at the University of Oxford (UK).





**Dr. Antonio Busalacchi**  
***University of Maryland Professor***

Dr. Antonio Busalacchi, University of Maryland (College Park) Professor and Director Earth System Science Interdisciplinary Center. He began his professional career in 1982 that year at the NASA/Goddard Space Flight Center. His research has supported a range of international and national research programs dealing with global change and climate, particularly as affected by the oceans. In 1991, he was appointed as Chief of the NASA/Goddard Laboratory for Hydrospheric Processes, and member of the Senior Executive Service. In 2000, he was selected as the founding director of the Earth System Science Interdisciplinary Center (ESSIC) at the University of Maryland and appointed to the faculty as Professor in the Department of Meteorology. Presently, he serves as Chair, NAS/NRC Board on Atmospheric Sciences and Climate, Chair, Joint Scientific Committee for the World Climate Research Programme, and Member, NAS/NRC Committee for the Assessment of NASA's Earth Science Program.



**Dr. David Novak**  
***NOAA Hydrometeorological Prediction Center Science and Operations Officer***

Dr. David Novak is the Science and Operations Officer for NOAA/NCEP's Hydrometeorological Prediction Center (HPC). HPC is responsible for providing national weather guidance to support local weather and river forecast offices, media, and the public. Dr. Novak is responsible for directing the HPC science program, training staff, and fostering professional development. He has served on several national committees confronting the challenge of generating, assessing, and communicating weather forecast uncertainty information. He has also led several national efforts to accelerate the transfer of promising research results into operational applications that improve weather forecasts. He is Assistant Editor for Weather and Forecasting and an active member of the American Meteorological Society and National Weather Association.



**Mr. David Pierce**  
***Chief, NASA Balloon Program Office***

In 2011, David Pierce was named the Senior Program Executive for Suborbital Research for the Science Mission Directorate. Since 2004, Mr. Pierce has been responsible for management of NASA's Scientific Balloon Program Office (BPO) at NASA Goddard Space Flight Center's Wallops Flight Facility, as well as the Columbia Scientific Balloon Facility (CSBF), located in Palestine, Texas. Mr. Pierce began his career with GSFC in 1986 as an Aerospace Engineer in the Wallops Aircraft Programs Branch. In 1998, he became a Mission Manager in the NASA Explorer Program, and managed the University Class Explorer (UNEX) and Small Explorer (SMEX) missions.

1:30 p.m. - 2:30 p.m.

## **TECHNOLOGY INVESTMENTS AND BENEFITS PANEL**

### **TRANSFERRING AND COMMERCIALIZING NASA TECHNOLOGY TO BENEFIT OUR LIVES**

NASA makes significant investments in commercial partnerships to advance the goals of the Nation and the agency. These partnerships yield a vast amount of innovative technology that benefits humankind. The panel will discuss the direct and indirect benefits of technology and innovation to our society, and will look at potential opportunities and partnerships between NASA, industry, academia, and other government agencies to contribute to the global economy.



**Mr. Daniel Lockney, Moderator**

***NASA OCT Technology Transfer Program Executive***

Mr. Dan Lockney is the technology transfer program executive at NASA Headquarters and editor-in-chief of NASA's annual Spinoff journal, which illustrates the everyday, tangible benefits of the America's investment in aerospace research and exploration. He is adept at bringing down to Earth more than 1,750 documented NASA spinoffs—demonstrating how they reach throughout the economy and around the globe, helping businesses to create jobs, generate revenue, and save money, while also saving and improving lives, making us safer, and providing better qualities of life to people everywhere.



**Dr. Gilmer Blankenship**

***University of Maryland Professor***

Dr. Gilmer Blankenship is Professor and Associate Chair for External Affairs, Electrical & Computer Engineering at James Clark School of Engineering, University of Maryland. Mr. Blankenship has conducted research in control system science for more than 35 years in applications of signal processing, scheduling theory, nonlinear adaptive control theory, and the design and application of software systems in robotics. Dr. Blankenship is the co-founder of Techno-Sciences Inc., a Maryland company engaged in satellite-based search and rescue, in maritime surveillance, and in government R&D programs. Dr. Blankenship is also the founder of TRX Systems, a company developing novel technology for location and tracking of personnel and assets in GPS denied areas. In 2009, Dr. Blankenship was selected as a Maryland International Businessman of the Year.



**Dr. Henry Hertzfeld**

***George Washington University Professor of Space Policy***

Dr. Henry Hertzfeld is a Research Professor of Space Policy and International Affairs at the Space Policy Institute, Center for International Science and Technology Policy, Elliott School of International Affairs, George Washington University. He is also an Adjunct Professor of Law at GW. He is an expert in the economic, legal, and policy issues of space and advanced technological development. Dr. Hertzfeld has served as a Senior Economist and Policy Analyst at both NASA and the National Science Foundation, and is a consultant to both U.S. and international agencies and organizations.



**Dr. Jayfus Doswell**

***Juxtopia LLC, Entrepreneur***

Dr. Jayfus Tucker Doswell is founder, president and CEO of Juxtopia LLC, a Baltimore based biomedical and information technology R&D company founded in 2001. The Juxtopia® human performance products are designed to integrate into a human's daily routine and improve human health and learning for a lifetime. Dr. Doswell's current research focuses on context-aware wearable computer, autonomous service robot, and innovative telemedicine platforms. Dr. Doswell is also co-founder of Phezu Space, Inc, a newly formed commercial space company focused on satellite servicing and space debris remediation. Additionally, Dr. Doswell is the director of the Google Lunar X PRIZE (GLXP) JURBAN team comprised of young student engineers competing with other teams around the world to launch and land a robot on the moon. Dr. Doswell personally mentors the development of innovative technology product development microenterprises from concept to market and encourages NASA technology transfer.



**Mr. Asher Gendelman**

***Zephyr Technology Director***

Mr. Asher Gendelman leads Zephyr's marketing effort and manages defense sales. Zephyr's Physiological Status Monitoring Solutions, which were evaluated by NASA, are currently used as a part of strength and conditioning training to extend the abilities of Special Forces, first responders, and athletes. Mr. Gendelman's efforts resulted rapid market adoption and international accolades through the Chilean Miner Rescue, NFL Combine and Good Morning America. Mr. Gendelman has spent the more than 25 years in the high-tech arena. His experience spans hardware and software products, as well as services in the IT, Homeland Security and Military markets.

2:45 p.m. - 3:45 p.m.

## **INSPIRATION/EDUCATION PANEL**

### **BUILDING IDEA FACTORIES FOR THE FUTURE**

As a Nation, America must maintain its commitment to excellence in science, technology, engineering and mathematics (STEM) education to ensure that the next generation of Americans can assume their roles and responsibilities in shaping the future. The panel will discuss the challenges and needs in the field of STEM education to sustain U.S. leadership and global competitiveness.



**Mr. Michael Lach, Moderator**  
***Department of Education***

Mr. Michael Lach leads science, mathematics, engineering, and technology education efforts at the U.S. Department of Education. Previously, Michael was Officer of Teaching and Learning for the Chicago Public Schools, overseeing curriculum and instruction in the 600+ schools that comprise the nation's third largest school district. Mr. Lach began his professional career teaching high school biology and general science at Alcé Fortier Senior High School in New Orleans in 1990 as a charter member of Teach For America, the national teacher corps. He was named one of Radio Shack's Top 100 Technology Teachers, earned National Board Certification, and was named Illinois Physics Teacher of the Year. He has served as an Albert Einstein Distinguished Educator Fellow, advising Congressman Vernon Ehlers (R-MI) on science, technology and education issues.



**Mr. Leland Melvin**  
***NASA Associate Administrator for Education***

Mr. Leland Melvin is NASA's Associate Administrator for Education and is responsible for the development and implementation of the agency's education programs that strengthen student involvement and public awareness about NASA's scientific goals and missions. Melvin joined NASA in 1989 as an aerospace research engineer at the agency's Langley Research Center in Hampton, Virginia. He joined the astronaut corps in 1998 and has served as a mission specialist on two space shuttle missions: STS-122 in 2008 and STS-129 in 2009. He has logged more than 565 hours in space. In 2003, Melvin co-managed the former Educator Astronaut Program, which recruited teachers to become fully-trained astronauts in an effort to connect space exploration with students across the country.



**Dr. Mohammed Eltayeb**

***Frostburg University Physics and Engineering Department Chair***

Mohammed S. Eltayeb received his PhD in electrical and computer engineering from The Ohio State University in 2004. He is an electrical engineering faculty and chair of the department of physics and engineering at Frostburg State University, and director of the Center for Future Engineers at Frostburg State University. His research interests are in the areas of distributed and parallel computing, computer organization, wireless and sensor networks, real-time embedded systems for space applications and robotics.



**Dr. Mary Bowden**

***University of Maryland Associate Director of Graduate Studies***

Dr. Mary Bowden is a Visiting Assistant Professor and Keystone Instructor in the Aerospace Engineering Department at the University of Maryland in College Park (UMCP), where she specializes in teaching undergraduate Statics, Mechanics of Materials, and Aerospace Structures. Dr. Bowden is currently Director of the Balloon Payload Program at UMCP, which was started 7 years ago, and has been sponsored by the Maryland Space Grant Consortium.



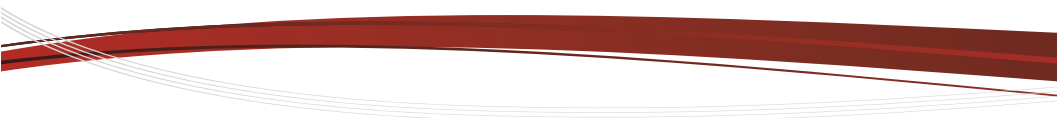
**Ms. Susan Bardenhagen**

***Classroom Educator, Fairfax County Public Schools,  
Union Mill Elementary School; VAST Region IV Director***

Susan Bardenhagen currently teaches third grade at Union Mill Elementary School, Clifton, VA and has been an educator for 37 years in New York, Maryland, and Virginia as a music specialist and a classroom teacher in grades 2-8. From the mid 1980s she has coordinated award-winning Ecology Clubs and since 2003 has been a mission team leader with the Federation of Galaxy Explorers. With membership in American Association of University Women, she has coordinated the "Girls + Math + Science = SUCCESS!" conference since 1991. Ms. Bardenhagen is the region IV director of the VA Association of Science Teachers, an educator associate member of AIAA, and recently participated in the National Science Teachers Association's co-sponsored K-12 STEM Education Conference.



## NOTES



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MARYLAND SPACE BUSINESS ROUNDTABLE





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